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THESIS

A PRAGMATIC ASSIZEMENT OF DEFENSE CONTRACTOR RISK, PROFITABILITY, AND DEBT: 1976-1984

by

David Joseph Louk

June 1987

Thesis Advisor: Dan C. Boger

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A Pragmatic Assizement of Defense Contractor Risk, Profitability, and Debt: 1976-1984

by

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Submitted in partial fulfillment of the
requirements for the degree of

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from the

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ABSTRACT

This thesis is an investigation into the measurement and analysis of the relationship between defense contractor risk and profit levels as compared to commercially oriented firms' risk and profit levels. Past studies that have attempted to quantify the interrelationship of risk and profit are examined. Hurdle's leverage, risk, market structure, and profitability model is used as a basis for the current model of risk and profitability. Empirical analyses of defense contractor risk and profit relationships are performed using least squares regression analysis, Chow tests, and three stage simultaneous regression analysis.

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I. INTRODUCTION

A. PURPOSE

Defense oriented firms have been studied extensively in the past to determine if the remuneration they receive is commensurate with a reasonable profit level. The defense industry is usually compared to the commercially oriented industry as a basis in profit level studies. The importance of equitable profit levels for defense firms is stated in the objectives of the Defense Financial and Investment Review, as, "Reform of federal procurement practices (are important) to insure the effective and efficient spending of public funds and at the same time maintain the viability of the defense industrial base." [Ref. 1:p. I-1]

Past studies of defense industry profitability have been attacked on numerous issues. Martin in his work on contractor risk points out, "previous studies have been widely criticized for biased premises, nonrepresentative samples, inaccurate data, and misleading variations in statistical averages." [Ref. 2:p. 10] In addition to the above inadequacies in previous studies, risk had not been factored in as a regulator of profit until Martin broached the risk factor in his study of the issue in An Empirical Assessment of Defense Contractor Risk 1976-1984. Martin says,

> None of the prior studies has totally reconciled the fact that rates of return are not completely comparable for having been earned under varying exposures to risk. Rather than ask what defense contractors' observed rates of return are, a more appropriate question would be whether defense contractors are appropriately rewarded for creative and wise risk taking. [Ref. 2:p. 10]

The purpose of this study is to expand on Martin's work exploring the profit versus risk issue. A basis for this exploration is the model which was constructed by Gloria Hurdle in 1974. Hurdle's model, which analyzed a cross section of American firms, will be adapted to analyze commercial versus defense firms while measuring risk, profit, and debt.

This investigation will seek a determination of profit, or return on equity levels, for defense firms, and compare those levels to commercially oriented industries. The profit levels will be examined for the amount and influence of risk involved and the effect of risk on profit levels.

B. OVERVIEW

In order to comprehend the profit versus risk relationship, previous work on this relationship must be examined. Chapter II takes a look at Martin's work on contractor risk and Hurdle's model for measuring risk and profit.

With a solid foundation of knowledge of the profit versus risk issue, a model for measuring these factors in defense and commercial firms is developed in Chapter III. The empirical formulation of profit and risk levels is presented in what the author calls the Boger model.

Chapter IV attempts to empirically assess the results of the Boger model. Conclusions drawn from this assessment are presented in Chapter V.

II. MARTIN AND HURDLE ANALYSIS OF RISK AND PROFIT

This chapter explores some of the previous work that has been attempted in the field of risk and profit forecasting or the explanation of profit as a factor of risk. Both profit and risk are easily quantifiable, but as the following studies show, they are not easily captured in a model which makes simultaneous predictions of risk and/or profit.

A. MARTIN ANALYSIS

Wayne Martin in his paper, An Empirical Assessment of Defense Contractor Risk 1976-1984, "analyzed four possible methods for the evaluation and quantification of defense contractor risk." [Ref. 1:p. 121] Martin did a mean-variance analysis of rate of return, capital asset pricing model, mean-variance analysis of backlog, and mean-variance analysis of five-year defense program elements. Martin used 13 DOD oriented firms and 36 commercially oriented firms for his data base.

Martin's objective was to quantify the relationship between defense contractors' risk and rate of return. He showed that while risk can be empirically assessed and rate of return can easily be measured, the two factors do not fit smoothly in a simple model tying the two factors of risk and rate of return together.

B. HURDLE ANALYSIS

In 1974 Gloria Hurdle presented what will be called the Hurdle model. This model is a simultaneous three-equation regression model that looked at leverage, risk, market structure, and profitability. Hurdle's model attempted to explain and quantify the relationships that exist between leverage, market structure, risk, and profitability. Hurdle used 228 United States manufacturing firms that covered 85 different industries in the 1960's.

Hurdle based her model on previous studies completed by Hall and Weiss, 1967; Shepard, 1971, 1972; Stigler, 1963; Kilpatrick, 1968; Collins and Preston, 1969; and Gale, 1972. All of these authors "have included a risk variable or a financial structure variable or both in a linear regression model. They commonly represented the degree of risk by the variability of profit over time (hereafter denoted σ)." [Ref. 3:p. 478]

According to Hurdle, stockholders are overwhelmingly risk averters who require a higher return, a risk premium as it were, for taking on more risk. Hurdle stated that when using profit variability for risk, its correlation with rate of return should be positive when the risk premium hypothesis is used. [Ref. 3:p. 478]

Hurdle stated that "there are two major hypotheses concerning risk and debt: (1) risk premium--high risk leads to high rate of return. (2) debt--requires low business risk, but causes large financial risk." [Ref. 3:p. 478]

According to Hurdle, a business's risk should be low under a minimum of two conditions. The first condition is when the industry is riskless. The second condition is when the business has the power to maintain stable profit through control of the industry's price or market structure. Because of this, a third condition must be included. Market power lowers business risk and allows for higher debt and rate of return.

These relationships described by Hurdle are conceptually illustrated in Figure 1. [Ref. 3:p. 479]

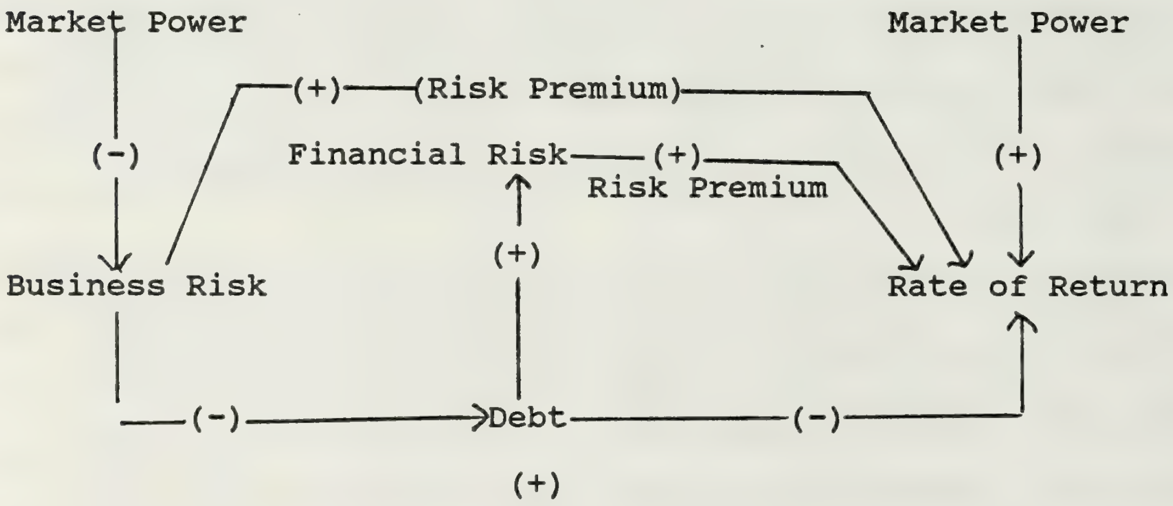

Figure 1. Market Power

The coefficients of these variables in a regression will be unknown a priori regardless of the variable used to estimate the business risk. Hurdle stated in her paper,

> The upper loop indicates a positive relationship between business risk and return on equity, while the lower loop indicates a negative relationship. Similarly, the relationship between debt and profitability is unpredictable. If the bottom loop dominates then debt and profits would be positively correlated. However, if low debt reflects large business risk, then the upper loop implies a negative correlation between debt and profitability. [Ref. 3:p. 479]

Hurdle uses a graph to show how risk is related to earnings on equity when considering two different types of firms, one being risk averse and the other being less risk averse.

Figure 2 [Ref. 3:p. 479] shows the earnings on equity plotted against risk to stockholders. Curve I is the risk averse firm, while curve II is the less risk averse firm. Risk to stockholders includes both business and financial risk.

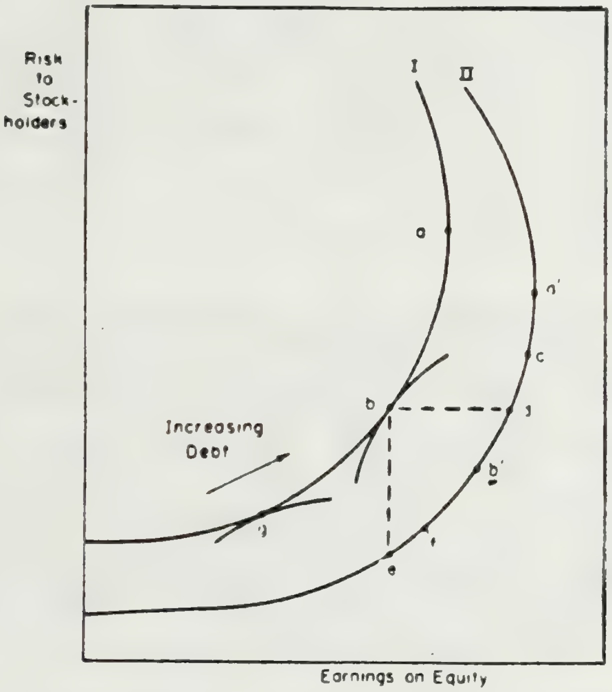

Figure 2. The Earnings-Risk Curve

Hurdle describes the curves as:

> Business risk varies from industry to industry, but it can be partially controlled by the firm, i.e., there is large inter-industry variation. Earnings and risk increase together up to some maximum (points A and A'), where the cost of debt becomes so high that earnings decrease with further debt. This is due to the rate of interest rising as debt increases. The firm is assumed to have a utility function, from which it decides the point on the earnings-risk curve which maximizes utility. The more horizontal the indifference curves, the more averse the risk to each firm is. Thus, the risk averse firm might choose point G, while a less risk averse firm would prefer point B.
>
> Curve II represents a firm with an alternative market structure. The ability of a firm to control price should decrease its riskiness (business risk), which would allow it to increase its debt (and thus increase return on equity) without increasing risk to stockholders. Thus an advantaged firm (one with market power) would have an earnings-risk curve somewhat like curve II in Figure 2.
>
> One can compare points on these two curves representing the same debt. Consider point B of Figure 2. This point represents some level of debt and some level of financial risk associated with that debt. One can locate the point on curve II corresponding to that same debt. Since financial risk corresponding to the same debt will be the same for both firms, but business risk will be lower for firm II, its risk to stockholders will be lower. Second, the earnings of firm II are higher because of its market power, plus the lower cost of its capital. Thus, B' (which represents the same debt as B) must lie somewhere between points D and E.
>
> This diagram shows the relationships among risk, earnings, and leverage depending on the utility functions of firms and must therefore be determined empirically. For example, if firm I chooses point B, and firm II chooses point C, then firm II will have higher debt, higher earnings, and higher total risk to stockholders. On the other hand, if firm II chooses point F, it will have lower debt, lower risk and higher earnings. Debt, therefore, cannot be used to measure business risk, since both C and F have the same business risk but different levels of debt. [Ref. 3:p. 480]

C. EQUATIONS

Hurdle's hypotheses are that can be used to measure total risk and that financial structure reflects an opportunity for the businessman to increase return on equity. She employs three dependent variables which are risk, financial structure, and rate of return using a three-equation simultaneous regression model to test the hypothesis.

1. Risk

According to Hurdle, "a large market share or strong oligopoly group should reduce business risk, because market share is usually related to market power or the ability to control price." [Ref. 3:p. 480] Size can be used to spread loses which decrease . Business risk may be alleviated by advertising intensity because it creates market power and also because it is an expense which can be cut when profits start to drop off.

2. Debt

"High-risk firms should have lower debt." [Ref. 3:p. 480] Hurdle also states that fast growing firms are likely to have high debt. The reasons for this are that the firm may be out of equilibrium due to fast or unexpected growth. Another reason for high debt among fast growth firms is that stockholders prefer debt for financing growth instead of new stock issues which dilute equity.

3. Profits

Hurdle's premise is that, "market share and the extent of oligopoly should be correlated with higher profits by allowing firms some control over price." [Ref. 3:p. 480]

The equations to describe debt, risk, and profit are:

Risk = constant - market share - advertising - assets
- concentration of market + (total assets/sales)
+ debt + demand variance

Debt = constant ± market share + growth in sales
± concentration of market ± profits - risk
+ assets + (total assets/sales)

Profit = constant + market share + advertising ± assets
+ concentration of market ± debt ± risk

D. HURDLE'S CONCLUSIONS

Hurdle's research enabled her to make a tentative indication that while market power keeps risk at a lower level than firms with low-market power, both high and low-market power firms have about the same relative levels of debt. Market structure (i.e., control over price) is the determining factor for profit differences among similar firms.

III. THE DATA AND METHODOLOGY

This chapter presents the data sources and methodology used in the analysis of the data. The empirical formulation of the data is presented in the Boger model.

A. THE DATA

The data base has its foundation in Martin's work, An Empirical Assessment of Defense Contractor Risk 1976-1984 [Ref. 2]. Martin based his work on 49 different companies for the years 1976-1984 broken into two groups consisting of 36 commercially oriented firms and 13 defense oriented firms. The 36 commercially oriented firms had less than 30 percent Department of Defense sales, and the 13 defense firms had greater than 30 percent Department of Defense sales.

This investigation uses the same 49 companies for the years 1976-1984 as a basis. This group of firms has been reduced to 13 defense firms and 24 commercially oriented firms. The reduction in commercially oriented firms is due to the lack of backlog data for the 12 discarded firms. The 37 firms used in this work are contained in Tables 1 and 2.

Each company has nine variables used in this study which are contained in the Appendix. These nine variables are discussed below.

TABLE 1

SAMPLE OF 24 COMMERCIALLY-ORIENTED CONTRACTORS

Company	NYSE Symbol
AVCO Corporation	AV
Control Data Corporation	CDA
E-Systems, Inc.	ESY
Emerson Electric Company	EMR
Fairchild Industries, Inc.	FEN
General Electric Company	GE
Goodyear Tire & Rubber Co.	GT
Gould, Inc.	GLD
Harris Corporation	HRS
Hercules, Inc.	HPC
Honeywell, Inc.	HON
International Business Machines	IBM
Motorola, Inc.	MOT
Penn Central Corporation	PC
RCA Corporation	RCA
The Signal Companies, Inc.	SGN
Singer Company	SMF
Sperry Corporation	SY
TRW Inc.	TRW
Teledyne, Inc.	TDY
Tenneco, Inc.	TGT
Textron, Inc.	TXT
Todd Shipyards Corp.	TOD
Westinghouse Electric Corp.	WX

TABLE 2

SAMPLE OF 13 DOD-ORIENTED CONTRACTORS

Company	NYSE Symbol
Boeing Company	BA
FMC Corporation	FMC
General Dynamics Corporation	GD
Grumman Corporation	GQ
Litton Industries Inc.	LIT
Lockheed Corporation	LK
Martin Marietta Corporation	ML
McDonnell Douglas Corporation	MD
Northrop Corporation	NOC
Raytheon Company	RTN
Rockwell International Corp.	ROK
Sanders Associates, Inc.	SAA
United Technologies Corp.	UTX

Backlog (BKLG) consists of those orders which cannot currently be delivered but will be filled within a later time period. Backlog data was collected from the SEC 10K reports in the same manner as described in Martin's An Empirical Assessment of Defense Contractor Risk 1976-1984 [Ref. 1:p. 110].

Debt (DEBT) is defined as the total liabilities of a firm as reported on the SEC 10K reports.

Assets (ASST) is defined as the total assets of a firm as reported on the SEC 10K reports.

Profit variation (PVAR) is a proxy variable for risk. PVAR is the result of taking the current year rate of return minus the mean rate of return for the years 1976-1984 and squaring the result.

Leverage (LEV) is the result of the current year debt divided by the sum of current year debt and current year shareholders' equity.

Assets divided by sales (ASSAL) is current year assets divided by current year sales for the year in question.

Sales (SALES) are a revenue transaction where goods or services are delivered to a customer in return for cash or an obligation to pay. Sales figures were taken directly from each firm's SEC 10K reports.

Shareholders' equity (SHEQ) is the owners' equity of each firm. Shareholders' equity was taken directly from each firm's SEC 10K reports.

Return on equity (ROE) is the rate of return on common shareholders equity calculated as:

$$\text{ROE} = \frac{\text{net income after taxes}}{\text{capital stock + surplus + retained earnings}}$$

B. METHODOLOGY

The methodology of the equations involved as derived from Hurdle's model [Ref. 3:p. 481] discussed earlier in Chapter II. Hurdle used three equations to describe risk, debt, and profits. The three equations, with their expected signs are described and contrasted below.

Hurdle's equation for risk is:

$$\begin{aligned}\text{Risk} = {} & \text{constant} - \text{market share} - \text{advertising} - \text{asset} \\ & - \text{concentration of market} + (\text{total assets/sales}) \\ & + \text{debt} + \text{demand variance}\end{aligned}$$

Boger's equation for risk is:

$$\text{PVAR} = \text{constant} - \text{backlog} + \text{leverage} - \text{asset}$$

In the Boger model, backlog is used to capture market share, concentration of market, demand variance, and advertising used in Hurdle's equation. Debt was captured by the same method used by Hurdle, but is called leverage in the Boger model. Recall that leverage is the result of debt divided by the sum of debt and shareholders' equity.

Hurdle's equation for debt is:

Debt = constant ± market share + growth in sales
± concentration of market ± profits - risk
+ asset + (total assets/sales)

Boger's equation for debt is:

Debt = constant + backlog - return on equity - PVAR
+ asset + (total assets/sales)

Once again, market share, growth in sales, and concentration of market are captured in backlog. Hurdle's profit is stated in the Boger equation as return on equity. Risk is measured by the term PVAR. The other terms in the two equations are the same except for debt. Debt in the Boger model is simply the current year total debt.

Hurdle's final equation is for profit.

Profit = constant + market share + advertising ± asset
+ concentration of market ± debt ± risk

The Boger profit equation is:

Return on equity = constant + backlog - leverage - asset
+ PVAR

As before, backlog was used to capture the esoteric terms (market share, advertising, and concentration of market) used in the Hurdle model. The other terms remain the same.

IV. EMPIRICAL ANALYSIS

This chapter presents the empirical analysis and the implications of this analysis. The methods of investigation are ordinary single equation regression for the combined firms, defense firms, and the commercial firms; Chow tests on the regression of individual years, and regression of three simultaneous equations for the combined years of 1976-1984.

A. ORDINARY LEAST SQUARES REGRESSION

The data contained in Table 3 show how the regressions for the Boger model compare to the Hurdle model for the year 1984. Similar results were obtained for the years 1983-1984. Results for the Boger model were in most cases not statistically significant.

The following differences were observed when comparing both defense firms and commercial firms combined to the Hurdle model. Profit variability is reduced by the constant factor in the Boger model for risk and is increased in the Hurdle model. The reason is that the profit variable is a fairly static term over the long run, and the constant is negative to dampen out the effects of the other variables in the equation. The Boger debt model has two variables which differ from the Hurdle debt model. These terms are profit variability and assets divided by sales. Profit variability

TABLE 3

ORDINARY LEAST SQUARES REGRESSION VARIABLES

COMBINED FIRMS

ROE = Constant + BKLG - LEV - ASST + PVAR	Boger
ROE = Constant + BKLG ± DEBT ± ASST ± RISK	Hurdle
PVAR = -Constant - BKLG + LEV - ASST	Boger
RISK = Constant - BKLG + Debt - ASST	Hurdle
DEBT = Constant + BKLG - ROE + PVAR + ASST - ASSAL	Boger
DEBT = Constant ± BKLG ± ROE - PVAR + ASST + ASSAL	Hurdle

DEFENSE FIRMS

ROE = Constant + BKLG + LEV - ASST + PVAR	Boger
ROE = Constant + BKLG ± DEBT ± ASST ± RISK	Hurdle
PVAR = -Constant + BKLG + LEV - ASST	Boger
RISK = Constant - BKLG + DEBT - ASST	Hurdle
DEBT = -Constant + BKLG + ROE + PVAR + ASST - ASSAL	Boger
DEBT = Constant ± BKLG ± ROE - PVAR + ASST + ASSAL	Hurdle

COMMERCIAL FIRMS

ROE = Constant + BKLG - LEV + ASST + PVAR	Boger
ROE = Constant + BKLG ± DEBT ± ASST ± RISK	Hurdle
PVAR = -Constant - BKLG + LEV - ASST	Boger
RISK = Constant - BKLG + DEBT - ASST	Hurdle
DEBT = Constant + BKLG - ROE + PVAR + ASST - ASSAL	Boger
DEBT = Constant ± BKLG ± ROE - PVAR + ASST + ASSAL	Hurdle

is a positive variable in the Boger model, while in the Hurdle model it is negative. The reason for this is that risk or profit variability tends to increase the debt load rather than decrease it. Hurdle found the same evidence for the years 1960 and 1964 in her work but chose to state that risk decreases the debt load.

Assets divided by sales have a negative influence on debt in the Boger model while the opposite is true for the Hurdle model. Debt is commonly employed to increase assets which in turn increase sales. It follows then that assets divided by sales would have a calming effect or negative effect on overall debt.

The comparison of the Boger model to the Hurdle model on defense firms only and commercial firms only yields the same results as above with two exceptions. The constant in the Boger model for defense firms for the debt equation has a negative effect as opposed to Hurdle's positive effect. Once again this is a dampening effect for the other variables in the equation. The other exception is that in the Boger risk equation backlog increases risk while in the Hurdle risk equation backlog decreases risk. The reason for this difference in the Boger model is that defense firms with a large backlog are more likely to have higher risk because of their inability to secure new contracts due to that large backlog.

B. CHOW TEST ON STRAIGHT LINE REGRESSION

A Chow test was performed on the results of the regression equation's sum of squares residuals for the combination of defense and commercial firms, defense firms only, and commercial firms only. The results of this Chow test are presented in Table 4.

TABLE 4

CHOW TEST

	ROE	5% CRITICAL VALUE	PVAR	5% CRITICAL VALUE	DEBT	5% CRITICAL VALUE
1984	2.03	2.57	.17	2.70	.38	2.49
1983	3.38		.99		.46	
1982	1.69		1.76		.65	
1981	4.15		3.87		3.89	
1980	1.60		.46		.42	
1979	.37		.20		.57	
1978	1.04		10.56		.84	
1977	1.38		.73		.64	
1976	1.02		.91		1.60	

The data from the years 1976-1984 were pooled to perform the Chow tests. Pooling was performed by combining all the years and comparing that to the combination of previous years plus the present year. An example makes this concept clearer. The years in this example are 1979-1984. All of the data from 1979 through 1984 are combined and compared to the data from the years 1980 through 1984 plus the data from 1979.

The Chow test showed that defense and commercial firms are the same with respect to profit, debt, and risk with five exceptions over nine years. In 1983 profit showed a significant difference but risk and debt did not. In 1981 profit, debt, and risk all showed significant differences between commercial and defense firms. This may be ascribed to the booming defense economy and the lagging commercial economy occurring at that time. The remaining difference is the risk in 1978. This may be an anomaly. All five exceptions need scrutinizing that is beyond the scope of this work to fully understand. It is concluded that all time series observations may be pooled with cross section observations.

In conjunction with the above discussion of the tests it should be stated that a two-stage least-squares simultaneous regression of all years combined was performed on all the data. The results of the two-stage regression were inconclusive.

C. THREE STAGE LEAST SQUARES MODEL

A regression analysis for the years 1976-1984 combined was completed on the firms under investigation. This regression analysis was a three-stage least squares model performed on the three simultaneous equations for debt, profit variability, and profit using the Boger model. The analysis was completed on all firms combined, defense oriented firms only, and commercially oriented firms only.

The data in Tables 5 and 6 compare and contrast the differences that arose between the data bases of combined, defense only, and commercial only firms. These differences are discussed in the section following Table 7.

TABLE 5

THREE-STAGE LEAST SQUARES REGRESSION DATA

DEPENDENT VARIABLE	ROE	PROFIT VARIABILITY	DEBT
COMBINED FIRMS			
Sum of Squared Residuals	19986.9	39297700	57936900
Standard Error	7.74	343.5	1319
Mean	14.7	68.4	2389.7
Standard Deviation	9.6	356.1	2607.6
R-Squared	.355	.06	.743
R-Squared Adjusted	.357	.07	.744
Durbin-Watson Statistic	1.8	2.01	1.8
DEFENSE FIRMS			
Sum of Squared Residuals	5575.1	22179700	6215930
Standard Error	6.9	138.2	231.4
Mean	16.25	56.1	1778.2
Standard Deviation	7.9	145.6	1281.9
R-Squared	.241	.091	.96
R-Squared Adjusted	.247	.099	.96
Durbin-Watson Statistic	1.85	2.1	2.1
COMMERCIAL FIRMS			
Sum of Squares Residual	13129.5	36693300	53633400
Standard Error	7.7	412.1	1575.7
Mean	13.8	74.7	2759.7
Standard Deviation	10.3	429.2	3049.1
R-Squared	.42	.07	.731
R-Squared Adjusted	.43	.08	.732
Durbin-Watson Statistic	1.9	1.9	1.9

TABLE 6

THREE-STAGE LEAST SQUARES REGRESSION COEFFICIENTS
(Standard Errors in Parentheses Below Each Coefficient)

	COMBINED	DEFENSE	COMMERCIAL
ROE			
Constant	14.5	6.1	17.6
	(1.8)	(3.3)	(2.14
Backlog	.00019	.0004	-.0005
	(.001)	(.0004)	(.0002)
Leverage	1.12	21.5	-5.6
	(3.1)	(5.25)	(3.5)
Assets	.000058	-.0008	.0001
	(.76)	(.0005)	(.00008)
Profit Variability	-.016	-.02	-.01
	(.12)	(.004)	(.002)
PROFIT VARIABILITY			
Constant	-327.1	-48.2	-418.2
	(81.1)	(66.8)	(110.3)
Backlog	-.11	.014	-.01
	(.008)	(.008)	(.01)
Leverage	721.6	244.6	887.1
	(130.3)	(104.8)	(176.8)
Assets	-.0001	-.03	.0003
	(.002)	(.01)	(.004)
DEBT			
Constant	389.1	-421.4	564.7
	(174.6)	(68.9)	(244.1)
Backlog	.17	.013	.2
	(.03)	(.01)	(.05)
ROE	3.13	15.1	-.17
	(9.2)	(2.9)	(14.5)
Profit Variability	.37	.78	.41
	(.45)	(.16)	(.6)
Assets	.35	.58	.32
	(.01)	(.02)	(.01)
Assets/Sales	33.8	211.4	33.9
	(38.6)	(25.7)	(52.8)

The data contained in Table 7 shows how the Boger model compares to the Hurdle model for the combined years 1976-1984. It is interesting to note how closely the Boger model approximates the Hurdle model when three-stage simultaneous

TABLE 7

THREE-STAGE REGRESSION VARIABLES

COMBINED FIRMS

$\text{ROE} = \text{Constant} + \text{BKLG} + \text{LEV} + \text{SST} - \text{PVAR}$	Boger
$\text{ROE} = \text{Constant} + \text{BKLG} \pm \text{DEBT} \pm \text{ASST} \pm \text{RISK}$	Hurdle
$\text{PVAR} = -\text{Constant} - \text{BKLG} + \text{LEV} - \text{ASST}$	Boger
$\text{RISK} = \text{Constant} - \text{BKLG} + \text{DEBT} - \text{ASST}$	Hurdle
$\text{DEBT} = \text{Constant} + \text{BKLG} + \text{ROE} + \text{PVAR} + \text{ASST} + \text{ASSAL}$	Boger
$\text{DEBT} = \text{Constant} \pm \text{BKLG} \pm \text{ROE} - \text{RISK} + \text{ASST} + \text{ASSAL}$	Hurdle

DEFENSE FIRMS

$\text{ROE} = \text{Constant} + \text{BKLG} + \text{LEV} - \text{ASST} - \text{PVAR}$	Boger
$\text{ROE} = \text{Constant} + \text{BKLG} \pm \text{DEBT} \pm \text{ASST} \pm \text{RISK}$	Hurdle
$\text{PVAR} = -\text{Constant} + \text{BKLG} + \text{LEV} - \text{ASST}$	Boger
$\text{RISK} = \text{Constant} - \text{BKLG} + \text{DEBT} - \text{ASST}$	Hurdle
$\text{DEBT} = -\text{Constant} + \text{BKLG} + \text{ROE} + \text{PVAR} + \text{ASST} + \text{ASSAL}$	Boger
$\text{DEBT} = \text{Constant} \pm \text{BKLG} \pm \text{ROE} - \text{RISK} + \text{ASST} + \text{ASSAL}$	Hurdle

TABLE 7 (CONTINUED)

COMMERCIAL FIRMS

ROE = Constant - BKLG - LEV + ASST - PVAR	Boger
ROE = Constant + BKLG ± DEBT ± ASST ± RISK	Hurdle
PVAR = -Constant - BKLG + LEV + ASST	Boger
RISK = Constant - BKLG + DEBT - ASST	Hurdle
DEBT = Constant + BKLG - ROE + PVAR + ASST + ASSAL	Boger
DEBT = Constant ± BKLG ± ROE - RISK + ASST + ASSAL	Hurdle

for debt, while in the Hurdle model for debt, risk (profit variability) has a negative effect. The reason for this variance is the same as stated earlier for the least squares regression of individual years model discussed previously in this chapter. Risk or profit variability tends to increase the debt load rather than decrease the debt load as Hurdle concluded.

All other independent variables in the combined years for the Boger models on debt, profit, and risk have the same effects as the independent variables in the Hurdle model. It must be noted that profit variability for the Boger debt model of combined firms was not statistically significant, displaying a *t*-ratio of less than one.

When comparing the defense only firms and the commercial only firms using the Boger model against the Hurdle model,

TABLE 7 (CONTINUED)

COMMERCIAL FIRMS

ROE = Constant - BKLG - LEV + ASST - PVAR	Boger
ROE = Constant + BKLG ± DEBT ± ASST ± RISK	Hurdle
PVAR = -Constant - BKLG + LEV + ASST	Boger
RISK = Constant - BKLG + DEBT - ASST	Hurdle
DEBT = Constant + BKLG - ROE + PVAR + ASST + ASSAL	Boger
DEBT = Constant ± BKLG ± ROE - RISK + ASST + ASSAL	Hurdle

regression is used instead of the ordinary least squares regression described earlier in this chapter.

The constant terms in the regression equations are discounted for their positive or negative effects when compared to the Hurdle model. The following differences came to light when comparing both defense and commercial firms combined in the Boger model to the Hurdle model. Profit variability is a positive variable in the Boger model for debt, while in the Hurdle model for debt, risk (profit variability) has a negative effect. The reason for this variance is the same as stated earlier for the least squares regression of individual years model discussed previously in this chapter. Risk or profit variability tends to increase the debt load rather than decrease the debt load as Hurdle concluded.

All other independent variables in the combined years for the Boger models on debt, profit, and risk have the same effects as the independent variables in the Hurdle model. It must be noted that profit variability for the Boger debt model of combined firms was not statistically significant, displaying a t-ratio of less than one.

When comparing the defense only firms and the commercial only firms using the Boger model against the Hurdle model, the profit variability described above carries over to both defense only and commercial only firms. In fact, the heavy influence of the Boger debt model independent variable profit variability in defense firms influences the combined firms and the commercially oriented firms to a significant degree when all three are combined.

The other exception for the defense firms is that the Boger model has backlog increasing the risk while the Hurdle model has backlog decreasing the risk factor. The fact that the positive effect of backlog on risk carries over from ordinary least squares regression to the combined years three-stage regression further strengthens the previous explanation of defense backlog. Namely, large backlogs are detrimental to defense firms attempting to secure new contracts.

V. SUMMARY AND CONCLUSIONS

The overall purpose of this study was to explore the relationship and effects of risk to profit levels in defense firms as compared to commercial firms. This involved a look at the past studies of Martin and Hurdle.

Hurdle's models for debt, profit, and risk were adapted to defense firms and commercially oriented firms in the Boger model. This provides a tool to evaluate the integrated relationship of profit, risk, and leverage among defense contractors.

It has become clear from this study that models such as Hurdle's see the financial structure of firms in the long run with an economic point of view. That is to say that the market forces of the economy will tend to reach an achievable and predictable state over a period of many years.

The Boger model demonstrates that defense firms are managed with a short run view of the economy. The accounting models of the economy look at the present year data and performance while discounting past or future trends. This accountant's point of view has been shown by the effect of backlog on profit variability and in turn the effect of profit variability on the debt structure. As was seen, backlog increases risk in the Boger model, and risk of profit variability increases debt.

Defense firms must operate in a short run mode due to the capricious nature of Department of Defense contracts and congressional impact on operations. Because defense firms must operate differently than commercially oriented firms, defense firms should not be judged by the same models used to measure profitability in commercially oriented firms.

APPENDIX

The following table (Table 8) shows the data for the individual defense and commercial firms. The data are listed by firm number which corresponds to an individual firm. The following list is used to identify the firms.

Firm #	Firm Name
1	Boeing Company
2	FMC Corporation
3	General Dynamics Corporation
4	Grumman Corporation
5	Litton Industries Incorporated
6	Lockheed Corporation
7	Martin Marietta Corporation
8	McDonnel Douglas Corporation
9	Northrup Corporation
10	Raytheon Company
11	Rockwell International Corporation
12	Sanders Associates, Incorporated
13	United Technologies Corporation
14	Avco Corporation
15	Control Data Corporation
16	E-Systems, Incorporated
17	Emerson Electric Company
18	Fairchild Industries, Incorporated
19	General Electric Company
20	Goodyear Tire & Rubber Company
21	Gould, Incorporated
22	Harris Corporation
23	Hercules, Incorporated
24	Honeywell, Incorporated
25	International Business Machines
26	Motorola, Incorporated
27	Penn Central Corporation
28	RCA Corporation
29	The Signals Companies, Incorporated
30	Singer Company
31	Sperry Corporation
32	TRW Incorporated
33	Teledyne, Incorporated
34	Tenneco, Incorporated
35	Textron, Incorporated
36	Todd Shipyards Corporation
37	Westinghouse Electric Corporation

TABLE 8

SEC DATA

	BKLG84	DEBT84	ASST84	PVAR84	SALES84
1	9895.09766	4790.00000	8485.00000	12.25000	10354.00000
2	1823.29980	1500.19995	2400.00000	88.35999	3337.79980
3	4630.69922	1972.79980	3034.79980	361.00000	7839.00000
4	2764.00000	901.59985	1445.19995	5.29000	2603.59985
5	1797.00000	2369.00000	4379.89844	3.24000	4605.69922
6	6605.19922	2014.09985	3166.00000	72.24998	8113.00000
7	1929.50000	1598.29980	2224.29980	86.48999	3920.39990
8	9282.00000	3847.50000	6191.29688	2.89000	9662.59766
9	3067.59985	1072.19995	1797.00000	34.81000	2547.79980
10	3483.00000	1620.89990	3600.09985	9.00000	5995.69922
11	7020.00000	3347.89990	5869.50000	22.09000	9322.09766
12	460.50000	209.00000	526.29980	1.21000	746.09985
13	8000.00000	5735.09766	9904.50000	2.56000	16331.79688
14	1582.50000	5747.69922	6915.50000	2.89000	1527.79980
15	1132.00000	7813.29688	9588.89844	37.20999	5026.89844
16	769.39990	129.29999	415.19995	6.25000	819.29980
17	707.39990	1110.39990	2979.59985	0.01000	4178.79688
18	520.69995	705.89990	928.79980	292.40991	898.79980
19	10030.19922	12157.00000	24730.00000	0.04000	27947.00000
20	599.50000	3023.00000	6194.29688	12.25000	10240.79688
21	693.79980	598.39990	1453.09985	4.41000	1399.39990
22	1031.00000	878.69995	1696.79980	34.81000	1995.79980
23	585.00000	1021.59985	2388.50000	2.56000	2571.00000
24	2604.00000	2378.89990	47598.00000	6.76000	5185.09766
25	944.00000	14903.00000	41392.00000	11.56000	27163.00000
26	2110.39990	1916.00000	4194.00000	9.61000	5534.00000
27	637.89990	1147.00000	2766.19995	6.76000	2569.09985
28	1039.79980	6130.69922	8220.69922	0.25000	10111.59766
29	1841.00000	2706.00000	5511.00000	0.64000	6005.00000
30	720.00000	986.29980	1470.00000	36.00000	2518.79980
31	2803.79980	2699.69995	5502.59766	9.61000	4914.00000
32	2432.00000	1724.00000	3480.59985	3.61000	6061.59766
33	1701.00000	1631.39990	2790.69995	542.88989	3494.29980
34	1700.00000	6639.00000	13079.00000	357.20996	8939.00000
35	1600.00000	1022.29980	2210.00000	7.84000	3221.09985
36	300.00000	253.09999	3838.00000	0.36000	622.29980
37	4500.00000	5409.59766	9150.39844	9.61000	10264.50000

Source: 10K Reports

TABLE 8 (CONTINUED)

	ASSAL84	LEV84	SHEQ84	ROE84
1	0.81949	0.56453	3695.00000	21.29999
2	0.71904	0.60984	959.79980	23.50000
3	0.38714	0.65006	1062.00000	35.89999
4	0.55508	0.62386	543.59985	19.89999
5	0.95097	0.54088	2010.89990	13.80000
6	0.39024	0.63617	1151.89990	29.89999
7	0.56737	0.71856	626.00000	28.09999
8	0.64075	0.62144	2343.79980	13.90000
9	0.70531	0.59666	724.79980	23.00000
10	0.60045	0.45024	1979.19995	17.20000
11	0.62963	0.57039	2521.59985	19.70000
12	0.70540	0.39711	317.29980	15.40000
13	0.60645	0.57904	4169.39844	15.50000
14	4.52644	0.83113	1167.79980	10.80000
15	1.90752	0.81483	1775.59985	1.80000
16	0.50677	0.31142	285.89990	21.39999
17	0.71303	0.37267	1869.19995	18.70000
18	1.03338	0.76001	222.89999	0.60000
19	0.88489	0.49159	12573.00000	18.09999
20	0.60486	0.48803	3171.29980	13.00000
21	1.03837	0.41181	854.69995	10.50000
22	0.85019	0.51786	818.09985	9.80000
23	0.92902	0.42772	1366.89990	14.40000
24	9.17977	0.49979	2380.89990	10.00000
25	1.52384	0.36005	26489.00000	24.89999
26	0.75786	0.45684	2278.00000	17.00000
27	1.07672	0.41465	1619.19995	10.50000
28	0.81300	0.74576	2090.00000	13.00000
29	0.91774	0.49102	2805.00000	10.20000
30	0.58361	0.67095	483.69995	13.50000
31	1.11978	0.49062	2802.89990	7.70000
32	0.57420	0.49532	1756.59985	15.20000
33	0.79864	0.58458	1159.29980	49.50000
34	1.46314	0.50761	6440.00000	4.80000
35	0.68610	0.46258	1187.69995	9.60000
36	6.16745	0.65946	130.70000	16.79999
37	0.89146	0.59119	3740.79980	14.30000

TABLE 8 (CONTINUED)

	BKLG83	DEBT83	ASST83	PVAR83	SALES83
1	9743.19922	4433.00000	7471.00000	37.20999	11308.00000
2	1888.69995	1292.00000	2752.39990	1.44000	3246.79980
3	5442.29688	1575.19995	2836.19995	33.64000	7146.29688
4	2200.00000	635.29980	1087.69995	47.60999	2254.69995
5	1791.00000	2169.79980	3999.39990	2.89000	3959.00000
6	5390.00000	2003.79980	2830.00000	108.15999	6490.00000
7	1483.00000	1534.79980	2380.09985	0.09000	3228.09985
8	8234.00000	2723.89990	4791.79688	1.21000	8111.00000
9	2268.69995	1019.09985	1596.00000	0.16000	2354.50000
10	3505.00000	1841.29980	3728.69995	14.44000	5630.69922
11	4860.00000	2863.79980	5231.09766	1.96000	8097.89844
12	376.79980	185.20000	466.19995	1.21000	578.09985
13	7865.00000	4936.39844	8720.09766	0.16000	14669.19922
14	1450.00000	5250.29688	6388.19922	12.25000	1514.19995
15	1042.00000	6951.09766	8777.59766	1.00000	4582.79688
16	652.09985	13.20000	370.59985	18.42999	826.79980
17	914.00000	813.79980	2515.59985	1.00000	3475.69995
18	404.59985	703.09985	948.39990	37.20999	891.50000
19	12207.69922	12018.00000	23288.00000	0.09000	26797.00000
20	542.29980	2969.50000	5985.50000	0.25000	9735.79688
21	613.00000	602.69995	1487.69995	0.36000	1335.39990
22	860.00000	875.79980	1637.09985	43.56000	1809.29980
23	392.00000	887.09985	2175.19995	0.49000	2629.00000
24	2794.00000	2350.00000	4663.69922	6.76000	4779.09766
25	825.00000	14024.00000	37243.00000	2.10000	23274.00000
26	2914.69995	1288.00000	3236.00000	1.96000	4328.00000
27	740.50000	1369.19995	2837.59985	42.24998	2538.89990
28	854.00000	5667.09766	7648.50000	1.69000	8977.29688
29	1682.00000	2551.00000	5184.00000	50.40999	6062.00000
30	630.00000	984.89990	1420.29980	0.04000	2476.59985
31	2661.19995	2880.89990	5279.79688	34.81000	4663.59766
32	2108.00000	1707.39990	3321.29980	19.35999	5492.89844
33	1700.00000	1211.00000	3852.19995	216.09000	2979.00000
34	1300.00000	10651.00000	12287.00000	30.24998	8770.00000
35	1266.00000	914.89990	2104.59985	24.00999	2979.79980
36	360.00000	223.20000	347.59985	65.60999	788.09985
37	4300.00000	5158.69922	8569.00000	4.00000	9532.59766

TABLE 8 (CONTINUED)

	ASSAL83	LEV83	SHEQ83	ROE83
1	0.66068	0.59336	3038.00000	11.70000
2	0.84773	0.46941	1460.39990	12.90000
3	0.39688	0.55539	1261.00000	22.70000
4	0.48241	0.58408	452.39990	24.50000
5	1.01020	0.54253	1829.59985	13.70000
6	0.43606	0.70806	826.19995	31.79999
7	0.73731	0.64485	845.29980	19.09999
8	0.59078	0.56845	2067.89990	13.30000
9	0.67785	0.63853	576.89990	17.50000
10	0.66221	0.49382	1887.39990	16.39999
11	0.64598	0.54746	2367.29980	16.39999
12	0.80643	0.39725	281.00000	13.20000
13	0.59445	0.56609	3783.69995	13.50000
14	4.21886	0.82187	1137.89990	9.00000
15	1.91534	0.79191	1826.50000	8.90000
16	0.44823	0.05249	238.29999	23.20000
17	0.72377	0.32350	1701.79980	17.79999
18	1.06382	0.74135	245.29999	11.60000
19	0.86905	0.51606	11270.00000	18.00000
20	0.61479	0.49612	3016.00000	9.00000
21	1.11405	0.40512	885.00000	9.00000
22	0.90483	0.53497	761.29980	9.10000
23	0.82739	0.40782	1288.09985	13.50000
24	0.97585	0.50389	2313.69995	10.00000
25	1.60020	0.37655	23219.00000	23.59999
26	0.74769	0.39802	1948.00000	12.50000
27	1.11765	0.48716	1441.39990	1.40000
28	0.85198	0.74094	1981.39990	12.20000
29	0.85516	0.49209	2633.00000	3.90000
30	0.57349	0.69345	435.39990	7.30000
31	1.13213	0.54565	2398.89990	4.90000
32	0.60465	0.51408	1613.89990	12.70000
33	1.29312	0.31437	2641.19995	11.50000
34	1.40103	0.86685	1636.00000	29.20000
35	0.70629	0.43471	1189.69995	7.50000
36	0.44106	0.64212	124.39999	24.29999
37	0.89892	0.60202	3410.29980	13.20000

TABLE 8 (CONTINUED)

	BKLG82	DEBT82	ASST82	PVAR82	SALES82
1	9132.00000	4780.00000	7593.00000	54.75999	9206.00000
2	2162.59985	1374.09985	2725.09985	0.16000	3187.29980
3	4685.59766	1464.50000	2639.50000	10.24000	6154.50000
4	1919.00000	678.50000	993.89990	121.00000	2056.59985
5	1767.00000	2159.89990	3836.79980	54.75999	4123.89844
6	3780.00000	1841.59985	2464.00000	470.88989	5613.00000
7	830.59985	2039.50000	2476.09985	29.15999	3033.09985
8	6528.19922	2802.19995	4621.79688	0.16000	7331.89844
9	2220.00000	845.50000	1352.50000	59.28999	2472.89990
10	3309.00000	1798.39990	3510.19995	6.25000	5217.29688
11	3840.00000	2773.00000	4870.29688	0.64000	7395.39844
12	300.00000	185.20000	336.09985	0.04000	436.19995
13	7605.00000	4574.50000	7993.29688	1.96000	13577.09766
14	1148.59985	5240.39844	6307.59766	32.48999	1222.59985
15	962.00000	5186.89844	6911.89844	1.44000	4292.00000
16	651.09985	124.39999	315.39990	0.04000	754.39990
17	805.09985	761.00000	2319.69995	0.25000	3502.29980
18	407.00000	674.79980	912.19995	7.84000	1093.19995
19	12070.89844	11417.00000	21615.00000	0.25000	26500.00000
20	542.00000	3428.69995	5885.89844	0.36000	9589.19922
21	691.00000	611.19995	1498.69995	0.36000	1257.00000
22	1000.00000	1016.19995	1612.89990	1.69000	1646.19995
23	345.00000	960.39990	2101.69995	10.24000	2621.89990
24	2573.00000	2312.00000	4455.39844	0.01000	4490.59766
25	705.79980	12581.00000	32541.00000	0.36000	1681.50000
26	1151.19995	1133.00000	2833.00000	11.56000	3786.00000
27	555.89990	1631.29980	3099.00000	1.21000	3165.39990
28	743.39990	5681.69922	7569.39844	2.89000	8016.00000
29	1238.00000	1329.50000	3024.00000	18.48999	3631.00000
30	600.00000	986.29980	1421.79980	67.23999	2523.39990
31	2878.50000	2896.69995	5288.19922	2.25000	5045.29688
32	2010.00000	1605.39990	3124.79980	17.64000	5132.00000
33	1479.00000	1204.29980	3290.69995	187.68999	2863.79980
34	1200.00000	9732.00000	11423.00000	70.56000	9143.00000
35	1201.00000	810.89990	2038.19995	30.24998	2936.00000
36	500.00000	216.39999	333.29980	118.81000	715.89990
37	4500.00000	5174.79688	8349.79688	9.00000	9745.39844

TABLE 8 (CONTINUED)

	ASSAL82	LEV82	SHEQ82	ROE82
1	0.82479	0.62953	2813.00000	10.40000
2	0.85499	0.50424	1351.00000	13.70000
3	0.42887	0.55484	1175.00000	13.70000
4	0.48327	0.68266	315.39990	28.59999
5	0.93038	0.56294	1676.89990	19.39999
6	0.43898	0.74740	622.39990	-0.30000
7	0.81636	0.82367	436.59985	24.20000
8	0.63037	0.60630	1819.59985	11.80000
9	0.54693	0.62514	507.00000	9.40000
10	0.67280	0.51234	1711.79980	17.70000
11	0.65856	0.56937	2097.29980	15.80000
12	0.77052	0.55103	150.89999	14.50000
13	0.58873	0.57229	3418.79980	15.30000
14	5.15917	0.83081	1067.19995	6.80000
15	1.61041	0.75043	1725.00000	9.10000
16	0.41808	0.39442	191.00000	18.70000
17	0.66234	0.32806	1558.69995	19.29999
18	0.83443	0.73975	237.39999	14.90000
19	0.81566	0.52820	10198.00000	17.79999
20	0.61380	0.58253	2457.19995	10.10000
21	1.19228	0.40782	887.50000	9.00000
22	0.97977	0.63005	596.69995	17.00000
23	0.80159	0.45696	1141.29980	9.60000
24	0.99216	0.51892	2143.39990	12.70000
25	19.35236	0.38662	19960.00000	22.09999
26	0.74828	0.39993	1700.00000	10.50000
27	0.97902	0.52640	1467.69995	9.00000
28	0.94429	0.75061	1887.69995	11.80000
29	0.83283	0.43965	1694.50000	6.70000
30	0.56345	0.69370	435.50000	-0.70000
31	1.04814	0.54777	2391.50000	9.30000
32	0.60889	0.51376	1519.39990	12.90000
33	1.14907	0.36597	2086.39990	12.50000
34	1.24937	0.85197	1691.00000	32.09999
35	0.69421	0.39785	1227.29980	6.90000
36	0.46557	0.64926	116.89999	27.09999
37	0.85679	0.61975	3175.00000	14.20000

TABLE 8 (CONTINUED)

	BKLG81	DEBT81	ASST81	PVAR81	SALES81
1	7755.59766	4299.00000	6954.00000	0.00000	9788.00000
2	2177.59985	1374.59985	2676.89990	0.36000	2855.19995
3	3391.39990	1217.29980	2289.29980	10.24000	4758.69922
4	1503.00000	801.79980	1067.09985	106.09000	1788.09985
5	1865.50000	3393.69995	3687.59985	98.00999	3977.79980
6	3430.00000	1686.59985	2105.00000	246.48999	5176.00000
7	966.29980	1051.89990	2251.89990	4.41000	2679.69995
8	7219.79688	2730.69995	4384.19922	2.25000	7384.89844
9	1729.50000	763.50000	1257.39990	256.00000	1990.69995
10	3353.00000	1827.79980	3363.79980	0.64000	5883.69922
11	3640.00000	2792.29980	4702.89844	0.09000	7039.69922
12	180.20000	102.29999	277.09985	0.64000	364.50000
13	7572.50000	4342.59766	7555.09766	0.16000	13667.69922
14	1096.69995	4868.50000	5893.79688	32.48999	877.69995
15	1145.00000	5310.29688	6887.89844	8.41000	4100.69922
16	562.00000	121.00000	280.39990	16.00000	572.00000
17	811.50000	845.00000	2288.19995	1.00000	3578.09985
18	586.79980	675.09985	902.39990	112.35999	1338.89990
19	12408.00000	11814.00000	20942.00000	0.04000	27240.00000
20	411.19995	3597.50000	5972.89844	0.64000	10323.50000
21	639.00000	686.59985	1564.39990	1.96000	1139.50000
22	1050.00000	853.89990	1409.39990	9.00000	1418.69995
23	295.00000	982.39990	2086.00000	0.25000	2856.89990
24	2786.00000	2216.00000	4314.00000	0.04000	4382.19922
25	595.00000	10946.00000	29107.00000	10.89000	12901.00000
26	1047.19995	1206.00000	2615.00000	1.00000	3570.00000
27	745.59985	3348.79980	3394.89990	25.00000	3348.79980
28	581.79980	7798.69922	7750.29688	106.09000	7798.69922
29	1345.89990	1349.79980	3008.00000	3.61000	3775.00000
30	600.00000	1127.89990	1573.19995	1.21000	27040.00000
31	2793.50000	2798.50000	5188.29688	5.29000	4896.09766
32	1562.00000	1709.00000	3126.59985	1.00000	5285.00000
33	1584.00000	1198.00000	2904.50000	4.00000	3237.59985
34	990.00000	8952.00000	10695.00000	171.60999	9584.00000
35	1206.00000	937.19995	2164.19995	0.25000	3328.00000
36	325.00000	209.00000	289.19995	156.24998	610.39990
37	4200.00000	5486.59766	8307.29688	18.48999	9367.50000

TABLE 8 (CONTINUED)

	ASSAL81	LEV81	SHEQ81	ROE81
1	0.71046	0.61821	2655.00000	17.79999
2	0.93755	0.51350	1302.29980	14.70000
3	0.48108	0.53173	1072.00000	13.70000
4	0.59678	0.75138	265.29980	27.89999
5	0.92705	0.70463	1422.59985	20.70000
6	0.40668	0.80124	418.39990	37.09999
7	0.84036	0.46712	1200.00000	16.70000
8	0.59367	0.62285	1653.50000	10.70000
9	0.63164	0.60721	493.89990	1.10000
10	0.57172	0.54337	1536.00000	21.00000
11	0.66805	0.59374	1910.59985	15.30000
12	0.76022	0.36918	174.79999	15.10000
13	0.55277	0.57479	3212.50000	14.30000
14	6.71505	0.82604	1025.29980	6.80000
15	1.67969	0.77096	1577.59985	10.80000
16	0.49021	0.43153	159.39999	14.90000
17	0.63950	0.36929	1443.19995	19.79999
18	0.67399	0.74812	227.29999	28.29999
19	0.76880	0.56413	9128.00000	18.09999
20	0.57857	0.60230	2375.39990	10.30000
21	1.37288	0.43889	877.79980	7.00000
22	0.99344	0.60569	555.89990	18.70000
23	0.73016	0.47095	1103.59985	13.30000
24	0.98444	0.51368	2098.00000	12.40000
25	2.25618	0.37606	18161.00000	18.20000
26	0.73249	0.46119	1409.00000	12.90000
27	1.01377	0.71892	1309.29980	12.90000
28	0.99379	0.82208	1687.89990	3.20000
29	0.79682	0.44874	1658.19995	12.90000
30	0.05818	0.71695	445.29980	8.60000
31	1.05968	0.53939	2389.79980	13.10000
32	0.59160	0.54660	1417.59985	16.09999
33	0.89712	0.41246	1706.50000	24.20000
34	1.11592	0.83703	1743.00000	36.79999
35	0.65030	0.43305	1227.00000	11.90000
36	0.47379	0.72268	80.20000	28.70000
37	0.88682	0.66046	2820.69995	15.50000

TABLE 8 (CONTINUED)

	BKLG80	DEBT80	ASST80	PVAR80	SALES80
1	8213.09766	3616.19995	5931.00000	65.60999	9426.00000
2	1587.69995	1249.89990	2495.79980	3.24000	2599.89990
3	3880.39990	1436.79980	2435.79980	11.56000	4383.39844
4	991.00000	634.89990	901.19995	37.20999	1558.59985
5	3219.39990	2097.50000	3264.29980	98.00999	3294.39990
6	2853.89990	2136.79980	2443.00000	153.75999	4445.00000
7	478.29980	717.39990	1820.50000	4.41000	1950.69995
8	6502.09766	2386.59985	3899.09985	6.76000	6058.09766
9	1560.29980	751.29980	1233.69995	0.64000	1655.39990
10	2648.00000	1625.00000	2928.50000	0.81000	4774.59766
11	3770.00000	2631.79980	4372.00000	1.21000	6906.50000
12	177.70000	104.39999	234.89999	0.01000	281.09985
13	7410.00000	4601.19922	7336.09766	0.25000	12323.89844
14	738.50000	4944.79688	5843.50000	0.36000	961.69995
15	993.00000	5094.39844	6549.09766	6.25000	3741.19995
16	410.50000	95.50000	235.70000	96.03999	442.19995
17	723.89990	730.29980	2007.39990	0.25000	3190.09985
18	916.00000	619.29980	808.19995	125.43999	906.19995
19	11782.00000	10311.00000	18511.00000	0.04000	24959.00000
20	315.09985	3721.69995	6024.19922	0.25000	9300.29688
21	773.19995	702.00000	1565.00000	1.96000	942.89990
22	950.00000	715.59985	1168.59985	3.61000	1177.09985
23	295.00000	921.50000	1974.79980	3.61000	2617.19995
24	2434.00000	2010.79980	3884.79980	7.84000	4063.79980
25	545.00000	10250.00000	26703.00000	0.04000	10919.00000
26	1049.79980	1042.00000	2292.00000	2.25000	3284.00000
27	311.00000	1645.69995	2726.89990	0.64000	2013.69995
28	581.79980	5196.50000	7058.69922	11.56000	7809.89844
29	1269.59985	1532.39990	2845.00000	3.24000	3201.00000
30	560.59985	1115.69995	1529.29980	2.89000	2659.69995
31	2730.19995	1821.19995	4205.59766	0.49000	4261.79688
32	1562.00000	1582.19995	2885.79980	1.96000	4984.00000
33	1533.39990	1174.59985	2575.89990	2.89000	2926.39990
34	827.00000	7381.00000	8943.00000	31.35999	7879.00000
35	1149.00000	1002.89990	2156.69995	5.29000	3338.29980
36	300.00000	128.89999	187.59999	285.60986	507.29980
37	3900.00000	4285.50000	6815.39844	22.09000	8514.29688

TABLE 8 (CONTINUED)

	ASSAL80	LEV80	SHEQ80	ROE80
1	0.62922	0.60971	2314.79980	25.89999
2	0.95996	0.50080	1245.89990	12.30000
3	0.55569	0.58987	999.00000	20.29999
4	0.57821	0.70451	266.29980	11.50000
5	0.99086	0.64256	1166.79980	21.89999
6	0.54961	0.87466	306.19995	9.00000
7	0.93325	0.39407	1103.09985	20.89999
8	0.64362	0.61209	1512.50000	9.60000
9	0.74526	0.60898	482.39990	17.89999
10	0.61335	0.55489	1303.50000	21.09999
11	0.63303	0.60197	1740.19995	16.09999
12	0.83565	0.44444	130.50000	14.20000
13	0.59527	0.62720	2734.89990	14.40000
14	6.07622	0.83197	998.69995	11.90000
15	1.75053	0.77788	1454.69995	10.40000
16	0.53302	0.40518	140.20000	9.10000
17	0.62926	0.36380	1277.09985	19.29999
18	0.89186	0.76627	188.89999	28.89999
19	0.74166	0.55702	8200.00000	18.50000
20	0.64774	0.61779	2302.50000	9.00000
21	1.59614	0.46645	803.00000	7.40000
22	0.99278	0.61236	453.00000	17.59999
23	0.75455	0.46663	1053.29980	10.90000
24	0.95595	0.51761	1874.00000	15.40000
25	2.44555	0.38385	16453.00000	21.70000
26	0.69793	0.45462	1250.00000	15.40000
27	1.35417	0.60351	1081.19995	8.70000
28	0.90381	0.73618	1862.19995	16.89999
29	0.88878	0.53863	1312.59985	12.80000
30	0.57499	0.72955	413.59985	9.20000
31	0.98681	0.43304	2384.39990	11.50000
32	0.57901	0.54838	1303.00000	15.70000
33	0.88023	0.45600	1401.29980	24.50000
34	1.13504	0.82534	1562.00000	29.29999
35	0.64605	0.46502	1153.79980	14.70000
36	0.36980	0.68710	58.70000	33.09999
37	0.80047	0.62880	2529.89990	15.90000

TABLE 8 (CONTINUED)

	BKLG79	DEBT79	ASST79	PVAR79	SALES79
1	9005.50000	3049.69995	4897.19922	92.15999	8131.00000
2	1324.59985	1281.39990	2434.69995	6.25000	3307.50000
3	7468.00000	1178.79980	2004.79980	23.03999	3641.79980
4	898.59985	565.69995	793.59985	81.00000	1372.69995
5	3006.89990	2722.39990	3653.19995	68.89000	4067.79980
6	2678.89990	1830.00000	2113.00000	72.24998	4058.00000
7	340.00000	804.00000	1773.50000	0.16000	2060.79980
8	6672.00000	2002.39990	3380.59985	5.29000	5278.50000
9	1092.00000	570.00000	990.39990	19.35999	1582.50000
10	1788.00000	1537.69995	2624.19995	1.96000	4774.59766
11	3650.00000	2533.89990	4073.09985	4.00000	6176.39844
12	113.70000	65.59999	130.89999	60.84000	164.09999
13	6825.00000	3958.50000	6468.09766	0.81000	9053.29688
14	592.39990	4410.69922	5300.39844	5.76000	862.79980
15	908.50000	5571.09766	6765.89844	6.25000	3173.79980
16	452.59985	108.59999	216.70000	2.89000	393.69995
17	642.29980	719.89990	1850.09985	0.09000	2834.00000
18	636.00000	219.50000	355.59985	136.89000	717.79980
19	8446.00000	9282.19922	16644.50000	0.64000	22460.59766
20	259.29980	3207.79980	5371.19922	7.29000	8238.69922
21	691.59985	775.79980	1546.59985	4.00000	806.00000
22	700.00000	475.19995	822.69995	16.81000	982.09985
23	200.00000	771.59985	1761.09985	28.09000	2345.39990
24	2045.09985	1722.69995	3339.59985	10.89000	3504.59985
25	450.00000	9548.79688	24530.00000	1.96000	9473.00000
26	945.19995	804.39990	1903.39990	2.89000	2713.69995
27	311.00000	4902.89844	5392.39844	13.69000	1636.19995
28	452.19995	4230.39844	5990.19922	6.76000	7454.59766
29	1193.29980	1666.79980	2850.50000	38.43999	4241.19922
30	406.00000	1099.89990	1482.39990	998.55981	2598.09985
31	2384.79980	2093.50000	3724.09985	8.41000	4201.59766
32	1441.39990	1555.00000	2749.00000	1.69000	4560.00000
33	1466.89990	755.39990	2030.79980	9.00000	2705.59985
34	611.00000	5557.00000	6795.00000	0.04000	6548.00000
35	1010.00000	994.09985	2079.09985	9.61000	3392.89990
36	280.00000	130.70000	152.39999	141.60999	389.69995
37	3800.00000	4571.50000	6821.50000	210.24998	7332.00000

TABLE 8 (CONTINUED)

	ASSAL79	LEV79	SHEQ79	ROE79
1	0.60229	0.62274	1847.50000	27.39999
2	0.73611	0.52631	1153.29980	11.60000
3	0.55050	0.58799	826.00000	21.70000
4	0.57813	0.71283	227.89999	8.60000
5	0.89808	0.74521	930.79980	20.29999
6	0.52070	0.86607	283.00000	12.90000
7	0.86059	0.45334	969.50000	18.39999
8	0.64045	0.59232	1378.19995	14.50000
9	0.62585	0.57553	420.39990	21.50000
10	0.54962	0.58597	1086.50000	21.59999
11	0.65946	0.62211	1539.19995	17.00000
12	0.79768	0.33452	130.50000	22.09999
13	0.71445	0.12451	27834.89844	13.00000
14	6.14325	0.83214	889.69995	14.90000
15	2.13180	0.82341	1194.79980	10.40000
16	0.55042	0.50115	108.09999	17.20000
17	0.65282	0.38911	1130.19995	19.09999
18	0.49540	0.61727	136.09999	29.39999
19	0.74105	0.55767	7362.29688	19.09999
20	0.65195	0.59722	2163.39990	6.80000
21	1.91886	0.50162	770.79980	10.40000
22	0.83769	0.57761	347.50000	19.79999
23	0.75087	0.43814	989.50000	18.09999
24	0.95292	0.51584	1616.89990	15.90000
25	2.58946	0.38927	14981.19922	20.09999
26	0.70140	0.42261	1099.00000	15.60000
27	3.29568	0.90922	489.50000	11.60000
28	0.80356	0.70622	1759.79980	16.09999
29	0.67210	0.58474	1183.69995	17.20000
30	0.57057	0.74197	382.50000	-24.09999
31	0.88635	0.56215	1630.59985	13.70000
32	0.60285	0.56566	1194.00000	15.80000
33	0.75059	0.37197	1275.39990	29.20000
34	1.03772	0.81781	1238.00000	23.89999
35	0.61278	0.47814	1085.00000	15.50000
36	0.39107	0.85761	21.70000	28.09999
37	0.93037	0.67016	2250.00000	-3.30000

TABLE 8 (CONTINUED)

	BKLG78	DEBT78	ASST78	PVAR78	SALES78
1	6915.50000	2099.59985	3573.19995	16.81000	5463.00000
2	1355.29980	1199.59985	2248.79980	1.00000	2912.59985
3	6591.00000	1104.69995	1778.69995	561.68994	2892.09985
4	786.39990	385.69995	602.09985	70.56000	1385.69995
5	1680.69995	620.59985	1379.89990	576.00000	3653.19995
6	2356.89990	1412.00000	1692.00000	3.24000	3485.00000
7	247.50000	701.29980	1565.19995	9.61000	1758.19995
8	5402.00000	1898.39990	3098.19995	1.44000	4130.19922
9	598.00000	575.00000	931.00000	57.75999	1829.79980
10	1858.00000	1606.29980	2345.39990	18.48999	3665.19995
11	2930.00000	2127.69995	3482.29980	4.00000	5308.79688
12	89.59999	52.59999	109.09999	396.00977	145.89999
13	5638.79688	2301.39990	4074.19995	0.49000	6265.29688
14	495.39990	3886.00000	4634.19922	15.21000	810.39990
15	717.00000	5142.89844	6200.79688	0.36000	2677.79980
16	400.79980	79.89999	172.20000	26.00999	340.39990
17	546.59985	497.50000	1467.09985	0.25000	2412.50000
18	565.00000	177.09999	274.89990	54.75999	543.69995
19	7831.00000	8449.29688	15036.00000	0.25000	19653.79688
20	216.39999	3122.89990	5231.09766	1.44000	7489.09766
21	828.89990	735.50000	1421.00000	2.25000	652.00000
22	575.00000	440.59985	71. 79980	9.61000	872.19995
23	155.00000	748.19995	2596.59985	0.00000	1946.39990
24	1786.89990	1460.69995	2826.09985	4.00000	2845.69995
25	375.00000	8277.69922	20771.29688	2.56000	8755.00000
26	660.89990	697.79980	1656.50000	0.16000	2219.69995
27	0.00000	4349.19922	4711.89844	44.89000	1317.59985
28	401.79980	3273.59985	4872.89844	15.21000	6600.59766
29	824.00000	1422.69995	2423.50000	26.00999	3571.79980
30	367.50000	946.89990	1435.39990	29.15999	2469.19995
31	2096.69995	1852.29980	3286.59985	2.25000	3674.09985
32	1256.00000	1349.00000	2382.00000	0.09000	3787.00000
33	1143.69995	722.50000	1588.19995	6.25000	2441.59985
34	650.00000	4158.00000	5455.00000	6.76000	5448.00000
35	884.00000	972.00000	1987.89990	17.64000	3230.59985
36	250.00000	118.39999	128.89999	364.80981	255.50000
37	3500.00000	3854.39990	6293.50000	1.44000	6663.29688

TABLE 8 (CONTINUED)

	ASSAL78	LEV78	SHEQ78	ROE78
1	0.65407	0.58760	1473.59985	21.89999
2	0.77209	0.53344	1049.19995	13.10000
3	0.61502	0.62107	674.00000	-6.80000
4	0.43451	0.64059	216.39999	9.20000
5	0.37772	0.44974	759.29980	-12.00000
6	0.48551	0.83452	280.00000	19.59999
7	0.89023	0.44806	863.89990	15.70000
8	0.75013	0.61274	1199.79980	13.40000
9	0.50880	0.61762	356.00000	24.79999
10	0.63991	0.68487	739.09985	24.50000
11	0.65595	0.61100	1354.59985	13.00000
12	0.74777	0.48213	56.50000	34.20000
13	0.65028	0.56487	1772.79980	13.20000
14	5.71841	0.83855	748.19995	16.39999
15	2.31563	0.82939	1057.89990	8.50000
16	0.50588	0.46400	92.29999	13.80000
17	0.60812	0.33910	969.59985	19.29999
18	0.50561	0.64423	97.79999	25.09999
19	0.76504	0.56194	6586.69922	18.70000
20	0.69850	0.59699	2108.19995	10.70000
21	2.17945	0.51739	685.50000	9.90000
22	0.82412	0.61297	278.19995	18.79999
23	1.33405	0.46862	848.39990	12.80000
24	0.99311	0.51686	1365.39990	14.60000
25	2.37251	0.38021	13493.59766	23.09999
26	0.74627	0.42125	958.69995	14.30000
27	3.57612	0.92302	362.69995	1.20000
28	0.73825	0.67180	1599.29980	17.39999
29	0.67851	0.58704	1000.79980	16.09999
30	0.58132	0.65968	488.50000	12.90000
31	0.89453	0.56359	1434.29980	12.30000
32	0.62899	0.56633	1033.00000	16.79999
33	0.65048	0.45492	865.69995	28.70000
34	1.00128	0.76224	1297.00000	21.09999
35	0.61533	0.48896	1015.89990	16.59999
36	0.50450	0.91854	10.50000	-2.90000
37	0.94450	0.61244	2439.09985	10.00000

TABLE 8 (CONTINUED)

	BKLG77	DEBT77	ASST77	PVAR77	SALES77
1	4141.89844	1209.09985	2440.39990	10.24000	4018.00000
2	1057.69995	1189.69995	2141.50000	0.64000	2292.19995
3	2200.00000	868.09985	1601.09985	4.00000	2597.29980
4	611.79980	393.19995	596.39990	2.89000	1409.89990
5	1153.89990	556.69995	1412.79980	30.24998	3442.89990
6	1832.50000	1350.00000	1569.00000	27.03999	3348.00000
7	232.50000	651.09985	1376.69995	22.09000	1439.69995
8	3893.50000	1411.69995	2467.50000	0.25000	3544.69995
9	929.50000	462.19995	747.39990	37.20999	1601.29980
10	1848.00000	1418.89990	2042.29980	5.76000	3182.09985
11	2620.00000	2078.19995	3330.29980	12.25000	5390.50000
12	60.20000	55.79999	80.50000	1162.80981	148.59999
13	4290.00000	1522.50000	2979.29980	0.16000	5550.59766
14	394.09985	3479.09985	4113.00000	34.81000	717.00000
15	520.59985	860.50000	1827.50000	1.96000	2301.39990
16	340.39990	66.00000	137.59999	57.75999	347.29980
17	460.39990	438.79980	1292.39990	0.04000	2030.79980
18	436.00000	133.79999	207.39999	22.09000	399.29980
19	6369.00000	7753.89844	13696.79688	0.00000	17518.59766
20	183.79999	2704.00000	4677.89844	0.81000	6627.79688
21	681.79980	617.29980	1225.79980	0.00000	1619.59985
22	450.00000	349.00000	579.19995	2.89000	646.19995
23	120.00000	694.29980	1477.50000	24.00999	1697.69995
24	1389.29980	1239.39990	2429.29980	0.25000	2312.59985
25	285.00000	6359.89844	18978.39844	0.01000	7060.09766
26	5020.00000	580.39990	1419.79980	0.01000	1853.50000
27	0.00000	3461.59985	3601.89990	2097.63989	120.09999
28	320.29980	2921.39990	4351.69922	14.44000	5880.89844
29	665.00000	1278.59985	2152.79980	0.36000	2964.39990
30	329.00000	1018.00000	1461.89990	187.68999	2284.79980
31	1668.00000	1545.69995	2841.79980	1.69000	3292.09985
32	944.00000	1167.00000	2092.00000	0.16000	3264.00000
33	934.59985	759.89990	1443.09985	4.84000	2209.69995
34	663.00000	3210.29980	4864.69922	24.00999	4928.00000
35	516.00000	816.50000	1738.19995	6.25000	2802.19995
36	137.50000	97.50000	108.29999	184.95999	213.20000
37	3000.00000	3233.69995	5527.59766	0.09000	6137.69922

TABLE 8 (CONTINUED)

	ASSAL77	LEV77	SHEQ77	ROE77
1	0.60737	0.49545	1231.29980	14.60000
2	0.93426	0.55555	951.79980	13.30000
3	0.61645	0.54219	733.00000	14.90000
4	0.42301	0.65929	203.20000	15.90000
5	0.41035	0.39404	856.09985	6.50000
6	0.46864	0.86042	219.00000	26.59999
7	0.95624	0.47294	725.59985	14.10000
8	0.69611	0.57212	1055.79980	11.70000
9	0.46675	0.61841	285.19995	23.20000
10	0.64181	0.69476	623.39990	22.59999
11	0.61781	0.62403	1252.09985	11.50000
12	0.54172	0.69317	24.70000	-19.79999
13	0.53675	0.51103	1456.79980	13.50000
14	5.73640	0.84588	633.89990	18.39999
15	0.79408	0.47086	967.00000	6.50000
16	0.39620	0.47965	71.59999	26.50000
17	0.63640	0.33952	853.59985	18.59999
18	0.51941	0,64513	73.59999	13.00000
19	0.78184	0.56611	5942.89844	18.29999
20	0.70580	0.57804	1973.89990	10.40000
21	0.75685	0.50359	608.50000	8.40000
22	0.89632	0.60256	230.20000	17.39999
23	0.87030	0.46992	783.19995	7.90000
24	1.05046	0.51019	1189.89990	12.10000
25	2.68812	0.33511	12618.50000	21.59999
26	0.76601	0.40879	839.39990	13.80000
27	29.99083	0.96105	140.29999	-37.89999
28	0.73997	0.67132	1430.29980	17.29999
29	0.72622	0.59392	874.19995	11.60000
30	0.63984	0.69650	443.59985	21.20000
31	0.86322	0.54392	1296.09985	12.10000
32	0.64093	0.55784	925.00000	16.70000
33	0.65307	0.52657	683.19995	28.39999
34	0.98715	0.65992	1654.39990	18.79999
35	0.62030	0.46974	921.69995	14.90000
36	0.50797	0.90028	10.80000	2.60000
37	0.90060	0.58501	2293.89990	10.90000

TABLE 8 (CONTINUED)

	BKLG76	DEBT76	ASST76	PVAR76	SALES76
1	3366.00000	932.50000	2017.29980	68.89000	3918.50000
2	897.00000	1051.29980	1919.50000	4.41000	2065.89990
3	1800.00000	813.19995	1457.19995	0.49000	2222.19995
4	649.09985	546.79980	556.79980	27.03999	1393.29980
5	1116.29980	1250.79980	2057.00000	72.24998	3354.50000
6	1500.00000	1419.00000	1586.00000	19.35999	3188.00000
7	160.00000	585.39990	1243.29980	47.60999	1213.09985
8	2948.00000	1184.29980	2129.59985	0.49000	3543.69995
9	1175.50000	325.09985	550.89990	1.44000	1265.09985
10	1561.00000	1167.79980	1704.00000	0.25000	2771.19995
11	2010.00000	1717.29980	2898.79980	22.09000	4691.19922
12	88.29999	64.39999	93.70000	27.03999	170.29999
13	3185.00000	1381.79980	2626.39990	1.44000	5166.19922
14	288.50000	3395.69995	3927.19995	22.09000	617.19995
15	414.00000	938.19995	1844.00000	9.00000	2114.50000
16	302.59985	70.79999	127.29999	46.23999	319.89990
17	383.89990	397.19995	1153.39990	2.89000	1695.19995
18	262.00000	100.50000	165.89999	104.03999	263.59985
19	6426.00000	6796.69922	12049.69922	0.36000	15697.29688
20	144.59999	2566.79980	4427.69922	9.00000	5791.50000
21	622.39990	939.50000	1129.50000	16.81000	1225.39990
22	280.00000	240.89999	441.09985	5.29000	513.79980
23	100.00000	666.09985	1430.19995	2.89000	1595.89990
24	1141.00000	1075.69995	2203.69995	6.76000	1973.09985
25	153.00000	560.59985	1297.59985	0.49000	1537.50000
26	368.09985	4974.00000	17723.29687	7.29000	5959.39844
27	0.00000	3381.79980	3540.50000	5791.20703	54.59999
28	292.00000	2560.00000	3837.69995	0.16000	5328.50000
29	564.00000	1086.39990	1900.59985	9.00000	2451.59985
30	251.29999	1215.69995	1589.00000	153.75999	2114.69995
31	1460.39990	1412.00000	2587.29980	2.56000	3216.29980
32	762.29980	1086.00000	1916.00000	228.00999	2929.00000
33	963.19995	734.89990	1228.50000	1.21000	1937.59985
34	715.00000	2657.09985	4262.69922	42.24998	4535.00000
35	378.00000	683.69995	1523.09985	4.00000	2627.09985
36	80.00000	105.29999	115.79999	817.95996	247.70000
37	4800.00000	3179.89990	5318.29688	0.64000	6145.19922

TABLE 8 (CONTINUED)

	ASSAL76	LEV76	SHEQ76	ROE76
1	0.51481	0.46225	1084.79980	9.50000
2	0.92914	0.54769	868.19995	12.00000
3	0.65575	0.55806	644.00000	16.20000
4	0.39963	0.74213	190.00000	12.40000
5	0.61321	0.60807	806.19995	3.50000
6	0.49749	0.89470	167.00000	25.79999
7	1.02489	0.47084	657.89990	11.90000
8	0.60095	0.55611	945.29980	11.50000
9	0.43546	0.59013	225.79999	15.90000
10	0.61490	0.68533	536.19995	19.70000
11	0.61792	0.59242	1181.50000	10.30000
12	0.55021	0.68730	29.29999	19.50000
13	0.50838	0.52612	1244.59985	12.70000
14	6.36293	0.86466	531.50000	17.20000
15	0.87207	0.50879	905.79980	4.90000
16	0.39794	0.55617	56.50000	25.70000
17	0.68039	0.34437	756.19995	17.09999
18	0.62936	0.60579	65.39999	7.50000
19	0.76763	0.56406	5253.00000	17.70000
20	0.76452	0.57971	1860.89990	6.50000
21	0.92174	0.83178	190.00000	4.30000
22	0.85851	0.54613	200.20000	13.40000
23	0.89617	0.46574	764.09985	14.50000
24	1.11687	0.48813	1128.00000	10.00000
25	0.84397	0.43196	737.19995	13.20000
26	2.97401	0.28065	12749.29688	18.79999
27	64.84433	0.95518	158.70000	-68.20000
28	0.72022	0.66707	1277.69995	13.90000
29	0.77525	0.57161	814.19995	8.00000
30	0.75141	0.76507	373.29980	19.89999
31	0.80443	0.54701	1169.29980	12.40000
32	0.65415	0.56681	830.00000	32.20000
33	0.63403	0.59821	493.59985	27.29999
34	0.93996	0.62334	1605.59985	17.20000
35	0.57976	0.44892	839.29980	14.40000
36	0.46750	0.90933	10.50000	-12.40000
37	0.86544	0.59792	2138.39990	10.40000

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